U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

1971 ANNUAL REPORT
OF

PLANT MATERIALS CENTER

COFFEEVILLE, MISSISSIPPI

PART I

T. A. BOWN
PLANT MATERIALS SPECIALIST

W. C. YOUNG
REGIONAL
PLANT MATERIALS SPECIALIST

B. B. BILLINGSLEY, JR.
PLANT MANAGER

W. L. HEARD
STATE CONSERVATIONIST

4-21025 REV. 9-72
USDA-SCS-FORT WORTH, TEX. 1972

Organization of the

Soil Conservation Service

Plant Materials Center

Coffeeville, Mississippi

Part I

Plant Materials Center Staff

B. B. Billingsley, Jr., ... Manager

J. H. Adams . . . . Supervisory Biological Technician

Lillian J. Stebbing . . . . . .Clerk-Stenographer

Oscar L. Chandler . . . . . Farm Equipment Operator

Fred W. Jackson . . . . . Farm Equipment Operator

Jimmie Miller . . . . . Farm Equipment Operator

James Smith . . . . . .Nursery Worker

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COFFEEVILLE PLANT MATERIALS CENTER

ANNUAL TECHNICAL REPORT

1971

This report covers activities of the Coffeeville Plant Materials Center for the calendar year 1971. The contents herein is written in summary form and great details are avoided.

The Coffeeville Plant Materials Center is located on Tillatoba Road, seven miles west of Coffeeville, Mississippi, on land leased from the U. S. Forest Service. Soil type, slope, amount of erosion, etc., varies considerably providing a variety of conditions under which plants may be tested.

Weather Summary

There were no extreme temperatures during 1971, although November and December temperatures averaged considerably above normal. A period of drought occurred during late June and most of July. Likewise, September, October, and November were very dry with less than 3.5 inches of rainfall during the three-month period. Total yearly rainfall was about normal at 52.66 inches.

I. Assembly of Plant Materials

A total of 283 accessions of plants were received by the Center in 1971. These plants will be established at the Center as soon as it is practical to do so. The following breakdown shows the purpose for which they will be observed and the general classes of plants.

A. Streambank or reservoir levee erosion control.

Seventy one accessions were received, including grasses and woody shrubs.

B. Roadbank erosion control.

Forty six grasses and legumes were received for observation.

C. Warm season forage production and/or erosion control.

Seventy-three accessions of grasses were received for observation.

D. Cool season forage production and/or erosion control.

Thirty-five accessions of grasses were received and have been established for initial observation.

E. Wildlife food

Twenty-four accessions of grasses, legumes, and woody plants were received for observation.

F. Miscellaneous

Thirty-four accessions of plants not suited to the five previous categories were received. These will be planted for observation at the proper time when a larger group of each category has been assembled.

II. INITIAL OBSERVATION

All plant accessions received by the Center are placed in initial observation. Seeds, or seedlings, are planted on a suitable site at the proper time of year. Those which germinate, or survive the transplanting, are given good cultural care. Notes concerning disease, insect and winter injury, seedling vigor, forage production, and other characteristics are recorded. This is done for at least three years unless the plants die before that time. Those plants which show good potential are carried into the advanced evaluation stage.

III. ADVANCED EVALUATIONS

Those plants which show potential in initial observation are placed in advanced observational tests for further evaluation. These tests are designed to obtain certain specific information about the plants in question. The testing procedure is dependent upon the potential use of the plant. The following are summarizations of advanced evaluations conducted wholly, or in part, in 1971:

A. Seashore paspalum (Paspalum vaginatum) and knotgrass (Paspalum distichum).

Six accessions of seashore paspalum and three accessions of knotgrass have shown potential for controlling streambank or reservoir levee erosion. In order for either to be very useful, a reasonable quantity of seed must be produced.

These nine accessions were established in 1970 in 5' x 20' plots in an area surrounded by a low dike. Wet soil conditions were maintained and moderate quantities of 13-13-13 were applied.

The following testing procedure was to have been followed in 1971; however, grass competition made it impossible to carry out this procedure. Changes, as indicated, were necessary.

Each plot was divided into two sub-plots. One sub-plot of each accession was to receive ammonium nitrate at the rate of 200 pounds per acre. All plots were mowed at 3-week intervals, after the water was removed and the soil dried somewhat.

When a majority of sub-plots began to produce good quantities of seed heads, mowing was stopped and seed allowed to mature. Each sub-plot was clipped, the clippings retained and threshed. Seed quantity and quality from each sub-plot was then to be determined.

None of the sub-plots produced seedheads in large numbers. Also, the quantity of material from the competition made it impossible to complete the clipping and seed threshing.

This test will continue in 1972 with a special effort being made to eliminate competition.

B. Maidencane (Panicum hemitomon)

Maidencane is a perennial, strongly rhizomatous grass adapted to wet soil conditions in much of the Southeastern United States. It has proven to be a good stream channel erosion control plant on some sites. It has never produced viable seed at Coffeeville,

Since the plant produces no seed, it is propagated from rhizomes. In order to effectively establish new plantings, it is very

useful to know:

1. The best month(s) to plant maidencane;

2. Whether shipping is injurious to the rhizomes.

Maidencane rhizomes were planted each month for 24 consecutive months (except that weather conditions in January, February, and March 1970 prevented any plantings), as follows:

1. Enough rhizomes were dug each month to plant six rows, each five feet long.

2. Rhizomes were planted end to end in each row about $1\frac{1}{2}$" deep.

3. Three rows were planted immediately after rhizomes were dug. The remaining material was packaged as for shipment and stored in the warehouse.

4. Two rows were planted after 24 hours of storage.

5. One row was planted after 48 hours of storage.

A check for initial survival was made as soon after planting as possible. Approximately one year after initial survival was determined, the following information was recorded:

1. Percentage ground cover (visual observation).

2. Width of spread (measured in inches).

The following conclusions were reached after the planting test was complete:

1. Storage up to 48 hours had no adverse effect on the rhizomes. Initial survival and width of spread averaged as well on the plantings made after 48 hours as on those made at 0 hours and 24 hours.

2. All plantings made had good initial survival except (a) the 48 hour planting for August 1969 and (b) all plantings made in October, November, and December 1969. The failure of the 48 hour planting for August 1969 and October 1969 plantings is unknown. An extremely cold period in January 1970 possibly injured the rhizomes of all November and December 1969 plantings.(These plantings were checked for initial survival on April 15, 1970.

   As was previously stated, plantings were not made in January, February, and March 1970 due to poor weather conditions.

3. Virtually all plantings with good initial survival produced a 90% to 100% ground cover within a year after initial growth. Spread on almost all plantings was 24 - 30".

This test indicates maidencane will survive storing well for at least 48 hours. Also, it could be successfully planted most months of the year, with the months of October - December being possible exceptions.

C. Requirements for Germination and Establishment of 5 Species of Plants.

The conditions required by many seed for successful germination and establishment are not known. In order to effectively utilize a plant established from seed, the best month(s) and depth(s) for planting should be known.

Five species of plants which have merit in the area served by the Center were selected for date and depth of germination test. The five are:

Echinochloa holubii, MS 924, Limpopograss
Panicum virgatum, MS 155, Pangburn switchgrass
Paspalum nicorae, MS 906, 'Amcorae' brunswickgras
Paspalum notatum, MS 131, 'Wilmington' bahiagrass

An area large enough to accomodate the plantings was treated with Methyl bromide to kill weed seeds. Rows were made up and allowed to settle before planting. One seedlot of sufficient size to make all plantings was used for each species. Plantings were to be made for 36 consecutive months, as follows:

1. Five hundred seed of each species was required for any particular monthly planting. Plantings were made at depths of 0", 1/4", 1/2", 1" and 1½" with 100 seed being planted on a 3-feet section of row.

2. Germination percentage was determined as soon as possible after planting.

3. The stand was rated for percentage of ground cover (visual observation) one year after planting.

Plantings were started May 2, 1968 and were to terminate in April 1971. Weather conditions in January, February, and March 1970 made it impossible to get plantings made. Also, grass seed apparently washed into the area and made it impossible to to accurately determine percentage of germination for the October, November, and December 1969 plantings.

The germination results are variable both from species to species and from planting depth to standing depth. Spreading lespedeza generally germinated best at depths of 1/2" or less. Limpopograss and Pangburn switchgrass germinated best at 1" or less. 'Amcorae' brunswickgrass and 'Wilmington' bahiagrass germinated best at 1/2" to 1½".

Survival of the April through July plantings appears best for all five species.

Due to the interruption in the planting schedule and the weed contamination, further plantings must be made to reach more conclusive results.

D. Treatments to Induce Germination in the Seed of Eastern Redcedar, Juniperus virginiana.

Eastern redcedar is commercially marketed as either sawlogs or fence posts in some areas served by the Center. There is an interest in improving the stand of redcedar on some sites in these areas. Transplanting seedlings is not desirable or successful on many sites. For this reason, a direct seeding method is needed.

Direct seeding would be made easier if seed could be harvested in the fall, cleaned, dried, stored, and planted the following spring.

Seed must be harvested soon after maturity; cleaned, and properly stratified, if germination is to occur the following spring. Even then, they must be planted very early, as germination occurs only at cool temperatures. As an attempt to overcome this dormancy problem, the Center ran a test using seed treatments on Eastern redcedar seed.

The following materials were used:

1. Cleaned, dry, Eastern redcedar seed, harvested in the fall of 1969.

2. Concentrated sulfuric acid.

3. Gibberellic acid as 0.857% Potassium gibberellate.

4. Three percent hydrogen peroxide solution.

Treatments were made as follows, in the order listed:

1. Sulfuric acid. Seed were soaked in the acid until a good portion of the seedcoat was removed, washed in cold water, and allowed to dry.

2. Hydrogen peroxide. Seed were soaked in the solution three hours, removed, and allowed to dry.

3. Gibberellic acid. Seed were dampened in the solution and allowed to dry.

One hundred seed were used for each of the following treatments: Treatment No.

1 - Sulfuric acid, plus hydrogen peroxide plus gibberellic acid

2 - Sulfuric acid plus hydrogen peroxide

3 - Sulfuric acid plus gibberellic acid

4 - Hydrogen peroxide plus gibberellic acid

5 - Sulfuric acid only

6 - Hydrogen peroxide only

7 - Gibberellic acid only

8 - Control: No treatment

Seed were treated and planted in flats in early April 1970. Flats were placed in the shade of trees.

No germination occurred in 1970 from any treatments. In April 1971 the following germination percentages were noted:

Treatment No.	% Germination
1	0
2	9
3	4
4	0
5	0
6	13
7	20
8	28

None of the treatments used induced any germination the first year. The control seed had the highest germination percent the second year; indicating the treatments were harmful to the seed.

IV. FIELD EVALUATION PLANTINGS

Evaluation of field plantings is covered in a report by the Plant Materials Specialist for Arkansas, Louisiana, and Mississippi.

V. PLANT AND SEED INCREASE

Plant and seed production for 1971 is shown in a table beginning on the following page:

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Plant and Seed Increases

Species	MS No.	PI or Other No.	Amount Planned Seed(lbs)	Amount Planned Plants(ea)	Area in Production	Amount Harvested Seed(lbs)	Amount Harvested Plants(ea)	Purpose of Increase *
Alnus glutinosa European black alder	2583			100	120' row		0	A.1
Alnus rugosa Hazel alder	3449			100	120' row		0	A.1.
Ampelopsis brevipen-dunculata, Amur amp.	2665			2,000	600' r.		2,000	A.1
Andropogon scoparius Little bluestem,	332,All 333,748,1772		Center Use		Est.1/10 ac.	0		E.4
Arachis monticola Reseeding peanut	528	263393	200#		1/4 Ac.	125#		E.6, C.4
Callicarpa americana American beautyberry	3298			500	50' r.		0	C.3
Castanea alnifolia Trailing chinquapin	4			800	190' r.		500	C.6
Castanea dentata American chestnut	3306			5	5' r.		2	C.6
Castanea dentata American chestnut	3321			10	8' r.		0	C.6
Castanea molissima Chinese chestnut	Several			5,000	600' r.		800	C.6

Plant and Seed Increases

Species	MS :No.	PI or :Other No.	Amount Planned :Seed(lbs)	:Plants(ea)	Area in Production	Amount Harvested :Seed(lbs)	:Plants(ea)	Purpose of Increase
Castanea ozarkensis Ozark chinkapin	3161			10	7' r.		0	C.6
Castanea ozarkensis Ozark chinkapin	3370			30	30' r.		0	C.6
Cornus florida Flowering dogwood	3476			1,300	600' r.		280	B.5,C.3
Crataegus sanguinea Redhaw hawthorn	3372			1,000	300' r.		0	B.5, C.7
Crataegus sp. Hawthorn	2671			6,000	600' r.		0	B.5, C.7
Cynodon dactylon TIFDWARF bermudagrass				300 sq.yds	5,000 sq.ft.		20 sq.yds	B.3
Cynodon dactylon TUFCOTE bermudagrass		BN 4198		300 " "	5,000 " "		159 " "	B.3
Echinochloa frumentacea Chiwapa millet	181	BN 8963	800#		1 acre	2,550#		C.2
Echinochloa holubii Limpopograss	924		All Produced (For Coffeeville PMC)		1.5 acres	0		B.3, B.8
Elaeagnus umbellata Autumnolive	429			600	150' r.		0	C.1,C.7
Elaeagnus umbellata Autumnolive	430			600	600' r.		10	C.1, C.7

Plant and Seed Increases

Species	MS No.	PI or :Other No.	Amount Planned :Seed(lbs)	:Plants(ea)	Area in :Production	Amount Harvested :Seed(lbs)	:Plants(ea)	Purpose of :Increase
Elaeagnus umbellata Autumnolive	432	BN 12090		2,500	900' r.		14	C.1,C.7
Eragrostis curvula Weeping lovegrass	FP		1,000		15 ac.	520		A.1,A.4
Eragrostis robusta Big lovegrass	394		50		1 ac.	2		E.2
Euonymus americana Strawberry bush	3368			10	2' r.		0	C.3
Euonymus americana Strawberry bush	3299			50	19' r.		0	C.3
Euonymus bungeanus Winterberry euonymus	2945			1,000	200' r.		0	C.1, C.7
Festuca arundinacea Ky 31 Fescue	1601		10,000		50 ac.	8,200#		C.4, C.7
Festuca arundinacea Arizona fescue	539		150		3/4 ac	50		E.1
Glycine ussuriensis Wild reseeding soybean	128		300		5 ac.	3,800		C.1,C.3,C.4
Hemerocallis sp. Tawny daylily	2165			8,000	1/4 ac		9,062	B.5
Ilex vomitoria Youpon holly	2946			50	50' r.		0	C.3, B.5

Plant and Seed Increases

Species	MS No.	PI or Other No.	Amount Planned Seed(lbs)	Amount Planned Plants(ea)	Area in Production	Amount Harvested Seed(lbs)	Amount Harvested Plants(ea)	Purpose of Increase
Lespedeza cuneata Sericea	2146		7,000 (FP)		75 ac.	11,600#		A.4, E.7
Lespedeza virgata Spreading lespedeza	126		400		2 ac.	470#		A.4
Lonicera maackii Amur honeysuckle	2161			3,000	600' r.		11	C.7
Malus hupehensis Crabapple	150			4,700	900' r.		920	B.5, C.7
Panicum hemitomon Maidencane	2138			200,000	3/4 ac.		7,100	A.1,D.1
Panicum virgatum Switchgrass	17		"All"		100' r.	0		E.4
Panicum virgatum Switchgrass	18		"All"		3 ac.	0		E.4
Panicum virgatum Pangburn switchgrass	155		300#		3 acres	0		E.4
Paspalum notatum Wilmington bahiagrass	131		2,000#		30 ac.	825#		E.7, A.4
Phyllostachys bissetii Bissett's bamboo	499		Per Request		300' r.		860 rh.	B.2, A.3

Plants and Seed Increases

Species	MS No.	PI or Other No.	Amount Planned Seed(lbs)	Amount Planned Plants(ea)	Area in Production	Amount Harvested Seed(lbs)	Amount Harvested Plants(ea)	Purpose of Increase
Phyllostachys meyerii Meyers bamboo	498		Per Request		300' r.		800 rh.	B.2,A.3
Phyllostachys sp. Hardy bamboo	500		Per Request		300' r.		0	B.2,A.3
Pistacia chinensis Chinese pistache	2182			2,700	600' r.		58	C.6,C.7, B.5
Prunus caroliniana Laurel cherry	3186			100	35' r.		0	B.5
Pyrus calleryana Callery pear	3477			30	5' r.		6	B.5
Pyrus sp. Pear	3281			10	5' r.		5	B.5
Quercus acutissima Sawtooth oak	3			1600	315' r.		1,530	C.3,C.6
Quercus myrsinaefolia Chinese evergreen oak	6			100	66' r.		0	B.5
Quercus myrsinaefolia Chinese evergreen oak	3204			25	18' r.		0	B.5
Rhamnus caroliniana Carolina buckthorn	3369			400	300'		0	B.5

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Plant and Seed Increases

Species	MS No.	PI or Other No.	Amount Planned Seed(lbs)	Amount Planned Plants(ea)	Area in Production	Amount Harvested Seed(lbs)	Amount Harvested Plants(ea)	Purpose of Increase *
Salix glaucophylloides Blueleaf willow	881			500	300' r.		0	A. 1
Trifolium nigrescens Ball clover	FP		1,000		10 ac.	360		E.1, E.6
Trifolium vesiculosum Meechee arrowleaf clover	329	PI 233782	1,200		9 a c.	1,700		E.1, E.6

*Listing of Problems begin on following page.

PROBLEMS requiring new plants are many and diverse. They are grouped in five categories, with problems in category A being given the highest priority and those in category E the lowest. Within each category the problems are arranged in order of importance; number one being the most important and the last problem the least important.

A. Problems Related to Sediment Producing Areas:

1. Controlling streambank erosion with vegetation.

2. Stabilizing gully erosion with vegetation.

3. Stabilizing sheet erosion sites with vegetation.

4. Controlling erosion on road embankments and cut banks with vegetation.

5. Vegetation mine spoil dumps.

6. Stabilizing water disposal areas with vegetation.

7. Controlling erosion on filled areas with vegetation.

B. Problems Related to Recreation and Improvement of the Environment:

1. Assemble information on the culture and management of plants needed for recreation and beautification purposes.

2. Screen plant material tc clock unsightly scenes from public view.

3. Ground cover plants in areas with heavy traffic.

4. Erosion controlling plants that will withstand heavy foot traffic in shaded areas are needed for parks, playgrounds and other recreational areas.

5. Ground cover plants to control erosion and improve the appearance of the area.

6. Assemble information about plants that are adapted to sites that have been contaminated with industrial wastes.

7. Winter annual grass other than ryegrass for recreational areas with heavy foot traffic.

C. Problems Related to Wildlife Habitat Improvement:

1. Quail Food and Cover. New plants are needed to provide cover and food on problem sites such as eroding calcareous soils and mine spoil areas and utility rights-of-way. This last plant must be unacceptable to grazing animals.

2. Waterfowl Food. New plants are needed to fit the wide variety of conditions on sites frequented by waterfowl. Plants are needed that are easy to maintain and manage and which will produce large amounts of seed or green plant food.

3. Deer Browse. Perennial Plants are needed to improve the winter deer browse.

4. Wild Turkey Food. There is a need for a perennial plant that will produce seed and fruit to improve wild turkey ranges.

5. Dove Food. Perennial seed producing plants would be desirable to replace annual crops which now leave the soil open to erosion for a short time each year.

6. Trees or shrubs to provide food for squirrels.

7. Trees or shrubs to provide seeds or fruit for songbirds.

D. Problems Related to Soils or Site Conditions:

1. Wave action erosion control in water impoundment structures with vegetation.

2. Ground cover plants for mine spoil areas.

3. Controlling wind erosion on croplands with vegetation.

4. Salt tolerant plants to control shoreline erosion along the Gulf Coast.

5. Salt and/or alkaline tolerant plants to control erosion on either calcareous soils or soils contaminated with salt.

6. Ground cover plants for eroding soils that are very acid.

E. Problems Related to Grassland Conservation:

1. Improving soil protection and forage production with a cool season pasture plant.

2. Improving soil cover and forage production on low fertility soils or sites.

3. Improving soil cover and forage production on wet soils or sites.

4. Improving soil cover and forage production on range sites in poor condition by reseeding.

5. Improving range management practices by assembling information on the growth of range plants.

6. Improving soil cover and forage production with adapted legumes.

7. Improving soil cover and warm season forage production on droughty soils.

8. A warm season forage plant that can withstand flooding.

9. A perennial grass to prevent soil erosion and provide high quality frosted forage for winter grazing.

10. A leguminous plant for early fall grazing.

11. A high yielding hay plant that can be established from seed.

VI. CERTIFICATION AND RELEASE

Four plants in the certification program were produced by the Center in 1971. They are:

Tifdwarf bermudagrass - Registered;
Tufcote bermudagrass - Registered;
Meechee arrowleaf clover - Foundation Seed;
Wilmington bahiagrass - Foundation seed.

VII. INFORMATION

A. New Articles

1. Numerous articles concerning Coffeeville Plant Materials Center were written in 1971. A few were written in newspapers of wider distribution.

2. The following named article concerning a plant developed by the Center was written in 1971:

   Wilborn, Ed, 1971. Meechee - Two Month's Extra Grazing. The Progressive Farmer 86(10):36

3. A publication entitled "Better Plants to Help Improve Our Environment" was published by the Soil Conservation Service in 1971. This brochure tells the story of the Plant Materials Center work in picture and story.

B. Visitations

A goodly number of persons visited the Center in 1971, mostly as small groups. These were made up largely of people from within the State; however, people from several states and at least three foreign countries did visit here.

VIII. TRAINING

Mr. Ricardo Samudio from Paraguay was at the Center the week of January 4 - 8, 1971. He received training in the purpose of plant materials work and how it is carried out. Mr. Samudio was shown plant materials in actual use in the immediate vicinity.